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FOREST PLANTING LEAFLET.

COFFEETREE (Gymnocladus dioicus).

FORM AND SIZE.

The coffeetree when grown in the forest reaches a height of from 60 to 100 feet and a diameter of from 1½ to 3 feet. The trunk tapers but little and is often free from limbs for from 50 to 80 feet. The branches are stout, pithy, and blunt and combine into a rather close crown.

When not crowded by other trees the trunk usually divides at from 10 to 15 feet from the ground into three or four branches, which spread only slightly and form a narrow, round-topped head.

RANGE.

Although one of the rarest of our forest trees, the coffeetree is equaled by few hardwoods in the extent of its range, growing as far north as Montreal and south to Arkansas. Its geographical distribution is from central New York and Pennsylvania west through southern Ontario and southern Michigan to the valley of the Minnesota River, eastern Nebraska, Kansas, and western Oklahoma, and south between the Mississippi River and the Allegheny Mountains to Tennessee. This range has been somewhat extended by seeding from cultivated trees. It is nowhere abundant, occurring only as a single tree in localities most favorable to its growth. Over large areas within its range it is entirely lacking or represented only by an occasional individual. The coffeetree is associated with the ashes, walnuts, hackberry, elms, basswood, cottonwood, honey locust, and hickories.

The range for economic planting coincides with the natural range and may in places be extended beyond it.

HABITS AND GROWTH.

The coffeetree grows naturally and best on the richest bottomlands, along banks of upland lakes and water courses, and in moist ravines; in such situations it attains its maximum development. It is adapted, however, to the drier, less fertile, and more sandy and gravelly soil of the uplands, but in such situations it grows more slowly and is smaller. It is not susceptible to climatic variations, and will endure the cold winters of Minnesota or the hot winds of western Oklahoma with no sign of injury.

The tree is essentially light-demanding, and, because of the thin, open nature of the foliage and its habit of coming into leaf late in the spring, does not shade the ground sufficiently to keep down grass and weeds if planted in a pure stand.

In barren soil the coffeetree is a slow-growing, long-lived species, which seldom attains a commercial size. Under normal conditions it is a rapid and moderately persistent grower. Under most favorable conditions the height growth for the first thirty or forty years often averages 1 to 2 feet annually, while the annual diameter increment may vary from one-fourth to one-half inch.

The root system of the coffeetree is extensive, and the roots often extend as far as 100 feet from the tree. When the tree is cut down the roots send up a large number of suckers.

The coffeetree is not known to be subject to injurious insect attack.

ECONOMIC USES.

The wood is heavy, moderately hard, very stiff, of coarse texture, and durable in contact with the soil. The heartwood is reddish; the thin sapwood, yellow. The wood shrinks and checks considerably in drying, works and stands well, and takes a good polish. It is used to a limited extent for cabinet work and posts, but is little known at present.

The coffeetree in the past has not been extensively planted in commercial quantities, but there seems ample reason why its future extension should be encouraged. It occurs in a variety of soils, and may be grown successfully throughout the greater part of the Middle West, being especially suited to moist river valleys and the soil along water courses. It has an advantage over many hardwood species adapted for western planting in that the wood is of more general value, being suitable for general construction purposes and durable in contact with the soil.

In pleasure grounds and for general ornamental planting it is quite a favorite, especially in the East, because of the unusual character of the leaves and the interesting and unique winter aspect of the tree; the blunt, naked branches give it a peculiar dead appearance, which is further augmented by the absence of foliage until late in the spring.

METHODS OF PROPAGATION.

The fruit, which matures in September or October, is a thick, broad pod, containing 6 to 9 large seeds (beans), inclosed in a jelly-like pulp. It is produced abundantly, and in the South and West gives rise to fair stands of seedlings in the neighborhood of the mother trees. The coffeetree is reproduced to a very limited extent by root suckers.

Because of the heavy nature of the seeds and the lack of any special means of dissemination, natural regeneration is not extensive. The root sprouts are also limited to the area which the main roots cover. Artificial propagation must be resorted to, therefore, as the only sure and rapid means of coffeetree reproduction.

The pods remain unopened on the trees for some months after reaching maturity, and may be collected at any time during the late fall or winter. They should be macerated in water, the seeds separated from the pods and pulp, and dried. In this condition the seed may be kept in a cool, dry place for several years with only a slight annual diminution in vitality. If desired for planting the following spring, they should be stratified in sand or stored dry during the winter.

Seed should be planted early in the spring after the following treatment has been given:

Place in a tub or pail the seeds which are to be planted and pour very warm water (150° to 160° F.) over them, stirring vigorously during the operation. Continue to stir for fifteen or twenty minutes, then cover the vessel and leave the seeds to soak for two or three days. At the end of this time sort out the seeds that have swollen, using a sieve with a mesh that will allow the seeds not swollen to pass through. Pour off the water from the remainder and soak again in warm water. Continue this treatment until all the seeds have become spongy and swollen. After being thus treated the seeds must not be allowed to dry out, but should be planted immediately.

Plant the seeds in nursery rows 2 to 3½ feet apart, spacing them 2 or 3 inches in the row, and covering 1 to 2 inches deep, and afterwards press the dirt down firmly.

One pound of seed contains about 450 seeds and is sufficient to sow 75 linear feet of drills. This amount should produce 250 to 300 plants.

PLANTING.

Transplanting to the permanent site may be done in the spring, when the plants are 1 year old, or delayed another year, the plants in the meantime being transferred to nursery rows. Better plants are secured by once transplanting in the nursery, but as a measure of economy they should be set out in the forest site the first year.

When making a forest plantation of coffeetree, it should be combined with such species as white elm, red elm, hackberry, oaks, and ashes. If planted several years previous to its associates, it may be mixed with hardy catalpa, Russian mulberry, or black locust. The growth and habits of the coffeetree in the Southwest are very similar to the growth and habits of the black walnut, and one may be substituted for the other in almost any plantation.

CULTIVATION AND CARE.

Plantations should be cultivated for the first two or three years if on tillable ground. In the prairie regions cultivation will be absolutely necessary for several years after planting in order to conserve soil moisture, since young coffeetrees provide very little shade.

The plantation must of course be protected from fire and the inroads of stock. In case of any serious insect attack specimens should be sent to the Bureau of Entomology of the Department of Agriculture for identification and suggestions as to control.

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